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ABSTRACT

A project to develop a "Self-instructional Conversion Model for Elementary Schools" comprising 46 audiotutorial lessons designed for use at various grade levels is described. Selected lessons were produced for language arts, mathematics, social studies, and science. Each teacher planned the lessons, organized the materials, tried the lessons with several pupils, made revisions, submitted lessons to the project evaluator who suggested further revisions, and finally teachers used them regularly with students. The lessons proved to be expensive in terms of production hours in relation to instructional time. Audiotutorial lessons were useful for reteaching children, giving further practice, and also in presenting new skills and new information to children who have a special interest in a subject. They did not appeal to elementary age children or to their teachers as much as the literature indicates they have appealed to older students. (Author/DGC)

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Final Report

Project No. 1-E-133
Grant No. OEG-5-72-0035 (509)

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ASSESSMENT OF A SELF-INSTRUCTIONAL CONVERSION MODEL FOR ELEMENTARY SCHOOLS

December 1973

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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AUTHOR'S ABSTRACT

The project to develop a "Self-instructional Conversion Model for Elementary Schools" permitted a group of elementary teachers to develop 46 audio-tutorial lessons designed for use at varying levels of the elementary school. Selected lessons were produced for language arts, mathematics, social studies and science. Theoretically, individual audio-tutorial lessons could enable learners to proceed at their own pace, have individual instruction, reduce the amount of teacher time devoted to the transfer of information, and provide a basis for planning some strategies for continuous progress in curriculum.

Each teacher planned the lesson(s), organized the materials, tried the lesson(s) with several pupils, made revisions, submitted lessons to the Project Evaluator who suggested further revisions, and finally teachers used them regularly with students.

These lessons proved to be expensive in terms of production hours in relation to instructional time (23 hours of production for 1 hour of instruction). Audio-tutorial lessons were useful for re-teaching children, giving further practice, and also in presenting new skills and new information to children who have a special interest in a subject. They did not have as great a use or appeal to elementary age children or to their teachers as the literature indicates they have had for older students.

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PREFACE

The initiative for this project to develop a "Self-Instructional Conversion Model for Elementary Schools" came from a teacher at King School who was dedicated to finding ways of providing individual instruction in the elementary school. After attending a conference about the Audio-Tutorial Approach to Learning at Purdue University, she developed some audio-tutorial lessons about geology for use in her own class and encouraged others in our school to try this approach for themselves.

The school system applied to the U.S. Office of Education for a grant to develop some self-instructional lessons which could be effectively introduced into the elementary classroom practice. These, we believed, would have the advantages of enabling learners to proceed at their own pace, permit individual instruction, reduce the time the teacher needed to devote to the process of transfer of information, minimize learner frustrations, bring success to the learner, and provide a basis for developing some continuous progress strategies.

The scope of the project was narrowed to a single school because changes within the administrative structure of our school system and an almost complete change in Central Administration personnel affected the operation of the project. As the Project Director and Principal of the elementary school where the project was to be implemented, I began by talking with the staff of our school about the project and invited teachers who were interested to meet with me for detailed planning. The Project Evaluator also attended these meetings. Subsequently, five teachers worked out lessons and units which they felt met needs in their respective teaching assignments. The Evaluator and I served as consultants and monitors of these lessons which were produced during the period from June 1972 through October 1973. These lessons were presented in abbreviated form to our total staff. They are currently available for use within our building and could be duplicated and circulated within the school system by our central Instructional Materials Center.

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METHODS

The method of writing the audio-tutorial materials was consistant with procedures advocated for the design of programmed instruction. The characteristics of such instruction are:

1. Information to be learned is presented in a way that requires an active response by the student.

2. There is a sequenced step by step presentation of the material.

3. There is immediate knowledge of results by the student.

4. There is self-pacing by students.

To be audio-tutorial all lessons have accompanying visual and auditory components.

The development of finished products resulted from the teachers' use of a 7 step design-test-revise cycle.

Step 1: Identifying General Goals

Teachers were asked to participate on a voluntary basis and describe a general idea. These included Math teaching of sets to Kindergarten, knowledge about use of homonyms for upper elementary pupils, study about the Civil War, environmental studies of Lake Michigan beaches, and identification of birds.

Step 2: Specifying Terminal Objectives

Tasks that students could demonstrate after using the units were identified and specified in the form of post tests. The modes of response included writing answers and talking to a tape recorder or to a teacher. In more complex units a series of interim tasks were designed. A minimal level of acceptable performance was also specified for each lesson.

Step 3: Writing Materials

Once the active responses to be demonstrated by the student were identified, the teachers prepared instructional materials using tapes, slides, tactile materials and reading materials on a step by step basis. These were reviewed and discussed by a curriculum consultant in terms of stated objectives, tasks and time requirements.

Step 4: Testing Materials

Each teacher was expected to tryout every step of a lesson and/or unit with several children. A project record sheet was used for each lesson. This provided information relative to the lesson, grade level, materials, tryout dates, necessary modifications and completed revisions. The consultant also tried materials with children and provided additional information concerning necessary modifications.

Step 5: Revising Materials

The teachers used the tryout information to revise or complete lessons. Tapes were remade, dittoes were reorganized or additional examples provided. At this point packaging and procedures for classroom use were detailed.

Step 6: Using Materials

The lessons were to be used in the classrooms or in the building library resource center during 1972-73. Materials were to be available to all teachers and students in the school. Lessons were from 5 to 20 minutes in duration. Packaging units was a major task since inefficiency at this point could lead to loss or damage of critical components of lessons. A school conference for the purpose of demonstrating the products of the project to all teachers in the school as well as to several district administrators was held.

Step 7: Evaluating Materials

Materials were to be evaluated in several ways. Firstly, the performance of students was to be assessed with the pre-post tests in the lesson. Secondly, the amount of student use was to be determined by sign out sheets or counting of completed post tests. Thirdly, student interest or enjoyment was reported on a questionaire or by teacher observation. Fourthly, teacher estimation of relevance and cost effectiveness was attained by a questionaire.

DESCRIPTIONS OF SELF-INSTRUCTIONAL LESSONS

Topics included language, reading, mathematics, history and science. The following outlines each self-instructional set of lessons designed. The description includes the components of the lessons, the number of minutes of instruction provided, number of hours to design, problem areas, and comments about the practical use of the lessons in the school setting.

1. Area: Mathematics
   Sub Skill: Sets

   The lesson was to help Kindergarten, First and Second Grade students learn the meaning of "member", count, follow directions and write or draw a set. Commercially produced packages of math cards were used in conjunction with ditto sheets and Language Master equipment. It provided 20 minutes of instruction and took 8 hours to produce. This lesson was used often in the special room for children with learning difficulties. The children liked the mechanical aspect and also the immediate feedback of the Language Master which was used for the audio-tutorial equipment. Once the child was instructed in the use of the equipment and the sequence of the materials in the package, he was able to follow very well.

2. Area: Mathematics
   Sub Skill: Sets 1-10

   As an introduction to the concept of sets and the use of sets 1-10 these ten lessons provided instruction in recognition, writing and rearrangement of numerals. This was accomplished with magnetic boards and objects, tactile numerals, dittos and tapes. The first 20 minute lesson required 10 hours between two teachers while the last 9 lessons were completed within 50 hours.

   Major problems involved changes in speech speed and vocabulary on tape and use of guidelines on board to locate sets.

   The lessons are used many times in the school's Math Lab. Children enjoy using them, listening to the tape and following the directions as they move the magnetic pieces and record the answers. The directions on the tape and the activities are easily understood by Kindergarten children.

3. Area: Mathematics
   Sub Skill: Division with a one digit divisor

   Ten lessons were designed, each with a tape, card deck and five dittos. Each lesson takes students 30-60 minutes to complete and 9 hours for the teacher to prepare.

   It has been used with children who showed an inability to divide

in their regular class work. They found it helped them to learn the process and they were pleased to have these lessons for individual instruction.

4. Area: Mathematics
Sub Skill: Fractions

Activities included in these five, 20 minute lessons include defining and writing a fraction, improper fractions, sets of fractions, equivalent fractions and sets of equivalent fractions. Each lesson required about 10 hours of teacher preparation and revision time. Major problems were in the area of specifying directions and cues for discriminating among concepts.

Lessons contained colorful and clever books of illustrations, tapes, exercises and/or felt materials. These lessons were used by 25 students individually and also with small groups of students. Nine of the 25 students passed the pretest and 16 students passed the post test.

5. Area: Perceptual Motor
Sub Skill: Spacial Relationships

Designed for use with students grades 2-5 with problems in visual and auditory discrimination, the tasks required use of colors and counting. Major problems occurred in organizing and training students to use media for different sections: a filmstrip, tape, cards, Language Master and spacial relationship cards. Sixty minutes of instruction was designed in 20 hours.

The problem of organizing these lessons was never successfully solved, so they were not used beyond the tryout stage.

6. Area: Reading
Sub Skill: Letter Recognition

This activity uses commercial as well as teacher made materials. A motor activity book (DLM Publishers) and tape are used as well as ABC Ed.V cards, Ideal Groovy letters, beaded letters and the use of a Language Master and cards. Completion of tasks would increase student skills in auditory discrimination, object identification, following directions, and fine motor coordination. It required 8 hours to complete.

These lessons are used with children who have learning disabilities. Some problems in training them to follow audio-tutorial procedures were encountered. Generally, the periods of use are monitored by the special education teacher.

7. Area: Reading
Sub Skill: Identifying Initial Consonants

This 25 minute set of tasks combined the use of the Language Master, filmstrips, tapes, dittos and commercially prepared consonant cards. It took 10 hours to design tasks for identifying the initial consonant and matching it with an object. Students gained practice in auditory memory and discrimination, following directions and verbal articulation.

The main problem was the inclusion of too many types of materials. Young children had difficulty moving from section to section and maintaining order with materials.

This material is used with children who are slow in developing readiness for formal reading. Most of the children require teacher assistance in using these lessons.

8. Area: Reading
Sub Skill: Consonant Blends (sh, th, ch)

This activity was designed for students, grades 2-6, to train auditory discrimination and memory. It took 4 hours to design the lesson of commercially prepared sound cards, dittos and the Language Master which provide about 20 minutes of instruction.

The major problem involved the directions to the learner and packaging.

These lessons are used with children who have learning problems. In practice they serve more as semi-independent lessons rather than completely self-instructional.

9. Area: Language
Sub Skill: Homonymns

Five lessons were prepared each using a tape, tagboard, dittos and pre and post tests. Fifth graders learned the following homonymns: to, too, two; their, they're, there; its, it's; your, you're; here, hear. Each lesson takes 20-30 minutes of student time and each took 5 hours to prepare. It was used by 35 students. Twenty-five of them passed the post test and only 5 passed the pre-test.

They are most valuable to average and above average students. Demonstration of successful completion of lessons did not necessarily result in demonstration of successful practice in subsequent written work.

10. Area: History
Sub Topic: Civil War

These five lessons provide an introduction to the significant

events and geographic features during the pre and post Civil War era. Slides, tapes and worksheets provide information and tasks for the learner. Each 20 minute lesson required 15 hours of preparation time. It was used by 90 students.

There were no major problems. The teacher, however, is of the opinion that children have more to gain from studying these materials as a group than they do from pursuing them individually. Evaluation is made from quizzes and class discussion. The collection of materials, the planning of the sequence of development, and the organization of the unit were and are valuable for instruction.

11. Area: Natural Science
Sub Topic: Identification of Birds of the Local Area

Identification of birds by using 35 mm. slides of birds made by a member of the community were converted to filmstrips and tapes were prepared to give pertinent information about the birds. Two filmstrips and tapes were produced each requiring 20 minutes. The titles are Friendly Birds of Michigan and Birds of Michigan's Woods, Meadows, and Ponds. After completing the lessons the pupil goes through the 31 slides without the tape to test his recognition of the birds.

The filmstrips are still in production so the lessons have not been used with children. The quality is good and we expect to use them later this year. Forty-five teacher hours were spent in producing 40 minutes of instructional time.

12. Area: Environmental Science
Sub Topic: Beaches of the Great Lakes

A series of lessons including filmstrips, handling of realia and experimentation was developed to teach children about the shore areas of the Great Lakes. Many concepts are included: conservation, plant life, erosion, formation of sand, waves, wind, seasonal change, recreation, homes, transportation, etc. Using the series of 35 mm. slides photographed by the teacher (converted to filmstrips) the tapes present information, ask questions, give directions for examining realia in the kit or performing experiments with the materials in the kit.

The teacher invested a total of four weeks time to prepare materials and package them into a sizable kit. The total time required to go through the lessons is 180 minutes at the minimum. Actually the kit is used more effectively if only a part of it is done at one time. The kit can be used by an individual or by a group or by a teacher and a group. It can be used with ages 5 through 15 by selecting the parts appropriate to the pupil.

One hundred and sixty hours (at least) were required for 180 (minimum) instructional minutes. Acquiring objects and designing packaging was a major problem for this unit. Except for tryout with individuals, the use has been with small groups or total classes.

RESULTS

Five teachers designed 46 lessons for 1360 minutes or about 23 hours of instruction. It took 555 hours to plan, write, test and revise the materials. Teachers worked about 23 hours for each hour of effective audio-tutorial materials produced.

Table Number 1, Summary of Production of Lessons, shows the amount of time spent to produce each lesson and the minimum length of time required for a pupil to complete each lesson.

Each teacher maintained a Project Record for Self-Instructional Lessons which was submitted to the Project Director and the Project Evaluator. On this record the Evaluator noted the modifications needed and the teacher also recorded the revisions made in each lesson. A sample of this form is included in the Appendix. Table Number 2 summarizes all of the individual record forms submitted by the teachers. Table Number 3 summarizes the modifications and revisions made in the lessons after tryout and review by the Evaluator. Table Number 4 gives a sample of one teacher's revisions for one sequence of lessons.

The units that were used, evaluated and revised with the curriculum consultant as Evaluator were used and enjoyed. In several instances where the Evaluator was not closely involved in the tryout we found that the lessons tended not to be used because they could not be adapted for use by other teachers. The teacher who developed these moved from the area before the work was satisfactorily revised.

CONCLUSIONS

The teachers who had worked on the Project and I talked informally about what had been done and how the lessons had been used. The conversation, as it evolved, indicated that each from her own experience in preparing the lessons and using them with children reached essentially the same conclusions. I have summarized these in the following paragraphs.

Use of the Lessons

The math, language use, and reading lessons were used in two ways:

a. for children who were having trouble and needed re-teaching or practice,
b. for children who wanted to go ahead and learn something new.

The Civil War, Beach, and Bird materials were used in various ways:

a. to present new material,
b. to give an individual child a chance to go over materials again for himself,
c. with total group or small group to present new materials,
d. taken apart and parts of it used with a group or by individuals,
e. to give a parent tutor the necessary information and technique for helping a child on a particular skill.

Interest in the Lessons

Children seemed to feel that these were something special and one child's experience would encourage another. The opportunity to use the tape recorder was a strong motivation. The child with some background about the subject seemed to be more interested in the Civil War, Beach, and Birds units.

On the whole, the teachers felt that a person talking about the material was more effective than the taped comment because the live teacher could adapt to the personalities and the situation and because questions and discussion made the lessons richer and more interesting.

Difficulties

1. Young children needed assistance in using the tape recorder and following the directions on the tape. They can be taught to be independent but some adult assistance is needed at first.

2. Materials get out of order and out of the containers.

3. Children tended to just leave the materials instead of putting them back in their containers even though the tape gave directions about this.

4. Packaging requires special containers. Some had to be custom made

by a carpenter and others required a search for commercially made items.

5. Many tape recorders, filmstrip projectors and slide viewers are needed.

6. Directions on tape are tedious and many children could be given general oral directions about stopping the recorder when they need time, etc.

Value

The teachers were unanimous in agreeing that the work on the project had been worthwhile but also that they would not want to do any more lessons. The value, they said, was in the experience of preparing a lesson or series of lessons down to the smallest detail and direction. This gave them a perspective on preparing other lessons. They felt that they had learned more about giving directions, organizing materials, planning sequences and providing opportunities for individual discovery and experiment. The Evaluator noted that all teachers involved learned how to do task analysis.

All were surprised at the amount of time required to collect materials, to prepare them for repeated use with lamination and secure fastening, for finding containers and packaging instructional materials for self-guided use. Everyone found that it was necessary to write a script and review it before recording on tape. Everything had to be ready and all moves carefully planned before the taping was begun.

In spite of the fact that no one was interested in preparing more self-instructional lessons, everyone would like to be able to buy lessons prepared commercially if ones suitable to the educational program of the class were available. Children can use them successfully and teachers see the value of such programs. The time invested in development is out of proportion to the use when such projects are undertaken on one teacher for one class basis. All of the lessons prepared for this project do serve as models so that others can see what is required to produce them and how pupils respond to such lessons. Obviously, increased use of the lessons would make the lessons less expensive in terms of production hours.

APPENDIX

Project Record for Self-Instructional Lessons

Teacher Questionnaire

Student Questionnaire

Sample Work Pages from Homonymns Kit

Project Record for Self-Instructional Lessons
(Use 1 Record Sheet for each lesson)

Lesson	Grade	Sub Skills	Materials	Pre Test	Post Test	Tape	# Try-outs	Date Tryouts	Time to do	Time to develop

Modifications Needed

Revisions Made

Project Developer_____

Project Evaluator_____
Signature

Date_____

Project Director_____
Signature

Teacher Questionnaire: King Self-Instruction Project

Date _____ Teacher _____ Unit _____

Please respond to the first four questions by using the following Ranking System: 3-great, 2-OK, 1-poor (Do one sheet for each unit.)

1. Rank the success of your unit in terms of student progress_____
2. Rank the success of your unit in terms of student enjoyment_____
3. Rank your enjoyment in designing this unit_____
4. Rank how well you feel you could help someone else design a unit _____
5. If the units have not been used please list possible reasons_____

   _____

   _____
6. How many students used the unit?_____ (Provide a sample record keeping form if possible.)
7. If pre/post tests were included, specify the number of students passing each one. (Provide a sample test if possible.)

   Pretest_____ Post test_____
8. If no pretests were included state how you estimated progress.

   _____

   _____

STUDENT QUESTIONNAIRE: KING SELF-INSTRUCTIONAL UNITS

Please have students respond to the first three questions by using the following ranking system: 3-great, 2-OK, 1-poor

1. How well did you understand or learn from the unit?_____

2. How much did you enjoy the lessons?_____

3. How well do you think you could explain what you learned in these lessons_____

4. How do you think your friends would like using these materials_____

_____

5. What did you like best about working on these kinds of materials?

_____

_____

HOMONYMNS KIT (Used by teacher in evaluating kit.)

Pupil's Name: Pretest score:

Lesson observed: Post test score:

Timing on tape:

Poor directions:

Poor choice of words:

Unclear idea:

Problems with card deck:

Problems with sheets:

Other:

Pupil's comments:

NAME_____ HOMONYMNS
PRETEST

UNDERLINE THE CORRECT WORD TO USE IN THE SENTENCE.

EX. (He, Him) is here.

1. Can you (here, hear) all that noise?
2. (Its, It's) a hard test.
3. Is that (your, you're) coat?
4. (Their, They're, There) are five boys in the class.
5. It is (their, they're, there) turn.
6. I can eat (to, too, two) banana splits.
7. Is your sister coming (to, too, two)?
8. The tree lost (its, it's) leaves.
9. Are you going (to, too, two) the store?
10. (Here, Hear) are the books you need.
11. I know (your, you're) hiding in the closet.
12. Please put the boxes (their, they're, there).
13. (Their , They're, There) coming to the party.
14. Please give this (to, too, two) your mother.
15. The cat is licking (its, it's) paw.
16. (Their, They're, There) team is going to win!
17. I drank (to, too, two) much pop.

HOMONYMNS

DIRECTIONS FOR SHEETS

WHEN YOU FINISH A SHEET:

Check your sheet with the answer sheet in the answer folder. Use one of the red pencils.

ALL RIGHT?

Give the sheet to your teacher. You may go on to the next tape.

DID YOU GET SOME WRONG?

Correct your mistakes. See your teacher if you need help or listen to the tape a second time.

Then take a copy of the sheet with the next higher letter but the same number. Try that sheet and see if you can get a higher score.

NAME_____

HOMONYMNS
PLANNING SHEET

THESE ARE THE LESSONS that you should do in the homonymns kit. You do not have to do the lessons that the teacher has crossed out.

WHEN YOU FINISH A SHEET, put an X in the correct box. You may not have to do every sheet, so you may not have an X in every box.

WHEN YOU FINISH A LESSON, put an X in the correct circle and go on to the next lesson that you have to do.

WHEN YOU FINISH ALL THE LESSONS THAT YOU HAVE TO DO, give this sheet to your teacher.

LESSON 1 - yellow - to, too, two

Tape and sheet 1A ▱

Sheet 1B ▱

Sheet 1C ▱

Sheet 1D ▱

I have finished lesson 1 ○

LESSON 2 - blue - their, they're, there

Tape and sheet 2A ▱

Sheet 2B ▱

Sheet 2C ▱

Sheet 2D ▱

I have finished lesson 2 ○

LESSON 3 - green - its, it's

Tape and sheet 3A ▱

Sheet 3B ▱

Sheet 3C

Sheet 3D

I have finished lesson 3

LESSON 4 - orange - your, you're

Tape and sheet 4A

Sheet 4B

Sheet 4C

Sheet 4D

I have finished lesson 4

LESSON 5 - red - here, hear

Tape and sheet 5A

Sheet 5B

Sheet 5C

Sheet 5D

I have finished lesson 5

NAME_____ HOMONYMNS
POST TEST

UNDERLINE THE CORRECT WORD TO USE IN THE SENTENCE.

EX. It is (she, her) turn.

1. Take this box (to, too, two) Aunt Mary.
2. The dog buried (its, it's) bone.
3. Tell them to leave (their, they're, there) boots outside.
4. Did you (here, hear) the sirens last night?
5. I want to go (to, too, two).
6. The book you want is over (their, they're, there).
7. Get (your, you're) dog out of here!
8. Are you going (to, too, two) the library?
9. Put your coats (here, hear).
10. The house lost (its, it's) roof in the tornado.
11. That's (their, they're, there) problem!
12. He took (to, too, two) much paper.
13. (Your, You're) late for school!
14. I know (their, they're, there) not in school today.
15. (Their, They're, There) are five math problems for homework.
16. (Its, It's) getting very late.
17. I will eat (to, too, two) hot dogs.

TABLES

Table Number 1 - Summary of Production of Lessons

Table Number 2 - Summary of Project Records for Self-Instructional Lessons

Table Number 3 - Typical Modifications Recommended and Revisions Made

Table Number 4 - Modifications Made for Lessons about Sets 1-10

Table Number 1

Summary of Production of Lessons

Teacher	Grade	Years of Teaching Experience	Topics of Lessons (# refers to text of report)	Number of Lessons	Minutes of Instruction	Hours to Produce
1. Engl	upper	3	Language-Homonymns (#9) Mathematics-Division (#3)	5 10 15 Total	150 450 600	25 90 115
2. Charles	Primary & Special Ed.	3	Reading (#6, #7, #8) Mathematics (#1) Special Ed. (#5)	3 1 3 7 Total	60 20 60 140	22 8 20 50
3. Sallade	upper	9	Social Studies-Civil War (#10) Mathematics-Fractions (#4)	5 5 10 Total	100 100 200	75 50 125
4. Stanifer	Primary	5	Mathematics-Sets 1-10 (#2) Science-Social Studies Beaches of the Great Lakes (#12)	10 2 12 Total	200 180 380	60 160 220
5. Platte	Middle	7	Science-Bird Identification (#11)	2 2 Total	40 40	45 45
				46	1360 22.66 hrs.	555

Table Number 2 Summary of Project Records for Self-Instructional Lessons

Lesson	Grade	Sub Skills	Materials	Pre Test	Post Test	Tape	# Tryouts	Date Tryouts	Time to do	Time to develop
1. Engl a. Language	4-6	Homonymns (5)	Tape, tagboard, dittos	X	X	5	5	7/72	5-30 min. lessons	25 hrs.
b. Math		Division (10)	Tape, tagboard, dittos	X	X	10	11	2/73, 6/73	10-30-60"	90 hrs.
2. Charles	K-2									
a. Reading		Alphabet (5 sub skills) auditory, object identification, motor, etc.	Book, tape, cards, groovy letters, beaded letters, Language Master	X	X	X	none		20 min.	8 hrs.
b. Math	K-2	Sets-counting, directions	Cards, Language Master, dittos, paper	X	X	no	2	6/19/73	20 min.	8 hrs.
c. Reading	K-3	Initial Consonants	Cards, Language Master, ditto, filmstrip viewer, tape	X	X	X	none		20 min.	10 hrs.
d. Reading	2-6	Consonant blends (3), directions, memory	Cards, dittos, Lang. Master	X	X	no	no		20 min.	4 hrs.
e. Spacial Relationships	2-5	Colors, directions, vis/aud. discrimination	Filmstrip, tape, cards, Lang. Master	X	X	X	no		3 @20= 60 min.	20 hrs.
3. Platte	3-7	Identification of Birds	Slides, Filmstrip, tape	X	X	2	5	7/73 9/73 11/73	40 min.	45 hrs.

Table Number 2 cont. Summary of Project Records for Self-Instructional Lessons

Lessons	Grade	Sub Skills	Materials	Pre Test	Post Test	Tape	# Try outs	Date Tryouts	Time to do	Time to develop
4. Stanifer a. Math	K	Concept 1 (10 lessons)	Magnetic objects, boards, dittos, tactile numerals, tape	X	X	X	4	6/72	15-25	10 hrs.
b. Math	K	Sets 2-10	same	X	X		no		10 @ 20 min.=200 min.	50 hrs.
5. Sallade a. History	3-12	Civil War (& geography, 5 lessons)	Slides, tape, dittos, maps		X	X	3	7/72	4 @ 20 min.	75 hrs.
b. Math	3-5	Fractions (5 lessons) definition lesson 1	Tape, booklet, answer envelope		X	X	3	7/72	20 @ 25	10 hrs.
		Numerator/denominator, improper fractions, fractions vs. sets, lesson 2	Felt boards, cut-outs, tape, booklet, answer				3		20 min.	10 hrs.
		equivalent fractions, lesson 3	cardboard pie., fractional pieces, booklet, dittos, tape	X	X	X	5	6-8/72	20 min.	10 hrs.
		sets of equivalent fractions, lesson 4	Booklet, tape	X	X	X	2	8/72	20	10 hrs.
		higher, lower terms, lesson 5	Felt pieces, booklet, tape		X	X	2	8/71	20	10 hrs.

Table Number 2 cont. Summary of Project Records for Self-Instructional Lessons

Lessons	Grade	Sub Skills	Materials	Pre Test	Post Test	Tape	# Try-outs	Date Tryouts	Time to do	Time to develop
6. Stanif	K-8	On the Beach, 2 long lessons, observation, experimentation, geology, environmental study	Tape, slides, filmstrip, sand, stones, feathers, driftwood, shells			2	4	5/73 6/73 7/73	180"	160 hrs.

Table Number 3

Typical Modifications Recommended and Revisions Made

Try out entire unit in class.

Use additional tactile materials.

Give better instructions from section to section.

Give better explanations.

Find better containers for materials.

Provide ready answers for pre and post tests.

Provide better instructions for pre and post tests.

Give fewer instructions.

Give more answers.

Alter speed of presentation on tape.

Need more time for some parts.

Provide for more active responses.

Avoid extraneous noises or background noises on tape.

Revise language on tape.

Color code the materials in the kit.

Arrange them in a logical sequence in the kit.

Provide more practice.

Provide less practice.

Table Number 4

Modifications Made for Lessons about Sets 1-10

1. Make all magnetic.
2. Increase working area.
3. Use larger manipulative objects.
4. Make numerals so child can "feel" them.
5. Draw lines to define where to make sets.
6. Provide child with <u>choice</u> whether or not to do one ditto.
7. Change confusing words on tape (ie. See not notice, Papers not dittos).
8. Change timing of some tapes.
9. Give answers to $\frac{1}{2}$ of post test dittos.
10. Eliminate "explanatory, supplemental discussion" to avoid losing child's attention (make tapes clear-concise!).
11. More <u>specific</u> directions (ie. put numeral <u>below</u> set-not next to set).
12. Talk about empty set.
13. Try harder to avoid extraneous, background noises on tape.